WHAT IS CLAIMED IS:

1. A creation method of a table for searching for and creating an m-dimensional and n-order table in which on the basis of m (m is a natural number of 4 or larger) reference axes, a symbol A = {a1, a2, · · ·, an} of n (n is a natural number of 2 or larger) elements different from each other appears once in an axial direction of each of the m reference axes, the creation method of the table being characterized by comprising:

a first step of setting the dimension number m and the order n, and determining and setting a permutation of the symbol A of the n elements and a selecting sequence in accordance with the permutation;

a second step of, when one of the n elements is set as an array element at each position of the table, starting this setting from a first position of all the reference axes and successively performing it to a final position of all the reference axes, and selecting the symbol in the selecting sequence at each position so that it does not coincide with the symbol of the already determined array element at a line of former positions in each axial direction; and

a third step of, when the symbol is selected in the selecting sequence at each position of the table so that it does not become coincident with the already determined array element at the line of the former positions in each axial direction, and when there is no symbol which can be selected

46

at an arbitrary position, continuing selection and determination by replacing the symbol of the already determined array element at a position one before the arbitrary position by a selectable symbol lower in the selecting sequence than the symbol.

2. A creation method of a table for searching for and creating a new m-dimensional and n-order table on the basis of an existing m-dimensional (m is a natural number of 4 or larger) and n-order (n is a natural number of 2 or larger) table, in which a symbol A = {a1, a2, · · ·, an} of n elements different from each other appears once in an axial direction of each of m reference axes, the creation method of the table being characterized by comprising:

a first step of setting the existing m-dimensional and n-order table, and determining and setting a permutation of the symbol of the n elements and a selecting sequence in accordance with the permutation;

a second step of arranging a symbol after successively returning along each axis in a direction toward a head position from an arbitrary position of each of the m axes of the existing table to a position where a symbol lower in the selecting sequence than a symbol of an array element of the existing table can be selected; and

a third step of, after the symbol is arranged at the position where the symbol can be selected, selecting and

47

determining a symbol as an array element in the selecting sequence at each position along each axis from the position where the symbol is arranged to the final position, so that it does not become a same symbol as an already determined array element at a former position of each axis.

3. A creation method of a table for searching for and creating a new m-dimensional and n-order table on the basis of an existing m-dimensional (m is a natural number of 4 or larger) and n-order (n is a natural number of 2 or lager) standard table, in which a symbol A = {a1, a2, $\cdots$, an} of n elements different from each other appears once in an axial direction of each of m reference axes, the creation method of the table being characterized by comprising:

a first step of setting the existing standard table in which elements at a line of positions on each of m-dimensional and n-order axes form a line in a selecting sequence, and determining and setting a permutation of the symbol of the n elements and a selecting sequence in accordance with the permutation;

a second step of arranging a symbol after successively returning along each axis in a direction toward a head position from an arbitrary position except for a head element position on each axis, which can not be changed since it forms a standard form of the existing table, to a position where a symbol lower in the selecting sequence than a symbol of an array element

of the existing table can be selected; and

a third step of, after the symbol is arranged at the position where the symbol can be selected, selecting and determining a symbol as an array element in the selecting sequence at each position along each axis from the position where the symbol is arranged to a final position, so that it does not become a same symbol as an already determined array element at a former position of each axis.

4. A creation apparatus of a table for searching for and creating an m-dimensional and n-order table in which on the basis of m (m is a natural number of 4 or larger) reference axes, a symbol A = {a1, a2, $\cdots$, an} of n (n is a natural number of 2 or larger) elements different from each other appears once in an axial direction of each of the m reference axes, the creation apparatus of the table being characterized by comprising:

a memory in which the m-dimensional and n-order table is stored;

setting means for setting the dimension number m and the order n, and determining and setting a permutation of the symbol of the n elements and a selecting sequence in accordance with the permutation;

first storage means for, when one of the n elements is set as an array element at a storage location in the memory corresponding to each position of the table, starting the storage of the array element from a storage location of a first position

49

of all the reference axes and successively performing it to a storage location of a final position of all the reference axes, and selecting and arranging the symbol in the selecting sequence set by the setting means at each storage location of each position so that it does not coincide with the symbol of the array element already stored in the storage location at a line of former positions in each axial direction; and

second storage means for, when the symbol is selected in the selecting sequence at each storage location of each position of the table in the memory so that it does not become coincident with a first symbol and a second symbol of the symbols of the already arranged array elements at storage locations corresponding to the line of the former positions in each axial direction, and when there is no symbol which can be selected and arranged at a storage location of an arbitrary position, continuing selection and arrangement by replacing the symbol of the already determined array element at a storage location of a position one before the storage location of the arbitrary position by a selectable symbol lower in the selecting sequence than the symbol.

5. A creation apparatus of a table for searching for and creating a new m-dimensional and n-order table on the basis of an existing m-dimensional (m is a natural number of 4 or larger) and n-order (n is a natural number of 2 or larger) table, in which a symbol A = {a1, a2, $\cdots$, an} of n elements different

from each other appears once in an axial direction of each of m reference axes, the creation apparatus of the table being characterized by comprising:

a memory in which the existing m-dimensional and n-order table is stored, and the new m-dimensional and n-order table is stored;

setting means for storing the existing m-dimensional and n-order table in the memory, and determining and setting a permutation of the symbol of the n elements and a selecting sequence in accordance with the permutation;

first storage means for arranging the symbol in a storage location of the memory after successively returning along each axis in a direction toward a head position from an arbitrary position of each of the m axes of the existing table to a position where a symbol lower in the selecting sequence than a symbol of an array element of the existing table can be selected; and

second storage means for, after the symbol is arranged at the storage location of the memory corresponding to the position where the symbol can be selected, selecting a symbol as an array element in the selecting sequence and arranging it in the corresponding storage location of the memory at each storage location of each position along each axis from the storage location where the symbol is arranged to the storage location corresponding to the final position, so that it does not become a same symbol as an array element already arranged

in the storage location at a former position of each axis.

6. A creation apparatus of a table for searching for and creating a new m-dimensional and n-order table on the basis of an existing m-dimensional (m is a natural number of 4 or larger) and n-order (n is a natural number of 2 or lager) standard table, in which a symbol A = {a1, a2, · · ·, an} of n elements different from each other appears once in an axial direction of each of m reference axes, the creation apparatus of the table being characterized by comprising:

a memory in which the existing m-dimensional and n-order table is stored, and the new m-dimensional and n-order table is stored;

setting means for storing the existing standard table, in which elements at a line of positions on each of m-dimensional and n-order axes form a line in a selecting sequence, into the memory, and determining and setting a permutation of the symbol of the n elements and a selecting sequence in accordance with the permutation;

first storage means for arranging a symbol in a storage location of the memory corresponding to a position after successively returning along each axis in a direction toward a head position from an arbitrary position except for a head element position on each axis, which can not be changed since it forms a standard form of the existing table, to the position where a symbol lower in the selecting sequence than a symbol

of an array element of the existing table can be selected; and

second storage means for, after the symbol is arranged in the storage location of the memory corresponding to the position where the symbol can be selected, selecting and determining a symbol as an array element in the selecting sequence at each storage location of each position along each axis from the position where the symbol is arranged to a storage location corresponding to a final position, so that it does not become a same symbol as an array element already determined in the storage location at a former position of each axis, and arranging it in the corresponding storage location of the memory.

7.   The creation apparatus of a table according to any one of claims 4 to 6, wherein the table stored in the memory is stored as the table having an m-dimensional and n-order data structure in which a position of an array element on each axis of the table is assigned to the storage location with a serial number.

8.   A creation program of a table for creating an m-dimensional and n-order table by a computer, in which on the basis of m (m is a natural number of 4 or larger) reference axes, a symbol A = {a1, a2, · · ·, an} of n (n is a natural number of 2 or larger) elements different from each other appears once in an axial direction of each of the m reference axes, the creation program of the table being characterized by causing the computer to execute:

a first step of setting the dimension number m and the order n, and determining and setting a permutation of the symbol of the n elements and a selecting sequence in accordance with the permutation;

a second step of, when one of the n elements is set as an array element at each position of the table, starting this setting from a first position of all the reference axes and successively performing it to a final position of all the reference axes, and selecting the symbol in the selecting sequence at each position so that it does not coincide with a symbol of an already determined array element at a line of former positions in each axial direction; and

a third step of, when the symbol is selected in the selecting sequence at each position of the table so that it does not become coincident with a first symbol and a second symbol of the symbols of the already determined array elements at the line of the former positions in each axial direction, and when there is no symbol which can be selected and determined at an arbitrary position, continuing selection and determination by replacing the symbol of the already determined array element at a position one before the arbitrary position by a selectable symbol lower in the selecting sequence than the symbol.

9. A creation program of a table for searching for and creating a new m-dimensional and n-order table by a computer

on the basis of an existing m-dimensional (m is a natural number of 4 or larger) and n-order (n is a natural number of 2 or larger) table, in which a symbol A = {a1, a2, · · ·, an} of n elements different from each other appears once in an axial direction of each of m reference axes, the creation program of the table being characterized by causing the computer to execute:

a first step of setting the existing m-dimensional and n-order table, and determining and setting a permutation of the symbol of the n elements and a selecting sequence in accordance with the permutation;

a second step of arranging a symbol after successively returning along each axis in a direction toward a head position from an arbitrary position of each of the m axes of the existing table to a position where a symbol lower in the selecting sequence than a symbol of an array element of the existing table can be selected; and

a third step of, after the symbol is arranged at the position where the symbol can be selected, selecting and determining a symbol as an array element in the selecting sequence at each position along each axis from the position where the symbol is arranged to the final position, so that it does not become a same symbol as an already determined array element at a former position of each axis.

10. A creation program of a table for searching for and creating a new m-dimensional and n-order table on the basis

of an existing m-dimensional (m is a natural number of 4 or larger) and n-order (n is a natural number of 2 or lager) standard table, in which a symbol A = {a1, a2, ···, an} of n elements different from each other appears once in an axial direction of each of m reference axes, the creation program of the table being characterized by causing the computer to execute:

a first step of setting the existing standard table in which elements at a line of positions on each of m-dimensional and n-order axes form a line in a selecting sequence, and determining and setting a permutation of the symbol of the n elements and a selecting sequence in accordance with the permutation;

a second step of arranging a symbol after successively returning along each axis in a direction toward a head position from an arbitrary position except for a head element position on each axis, which can not be changed since it forms a standard form of the existing table, to a position where a symbol lower in the selecting sequence than a symbol of an array element of the existing table can be selected; and

a third step of, after the symbol is arranged at the position where the symbol can be selected, selecting and determining a symbol as an array element in the selecting sequence at each position along each axis from the position where the symbol is arranged to a final position, so that it does not become a same symbol as an already determined array

56

element at a former position of each axis.

11. A table creation program storage medium storing a program for creating an m-dimensional and n-order table in which on the basis of m (m is a natural number of 4 or larger) reference axes, a symbol A = {a1, a2, · · ·, an} of n (n is a natural number of 2 or larger) elements different from each other appears once in an axial direction of each of the m reference axes, the table creation program storage medium being characterized by storing the program for causing a computer to execute:

a first step of setting the dimension number m and the order n, and determining and setting a permutation of the symbol of the n elements and a selecting sequence in accordance with the permutation;

a second step of, when one of the n elements is set as an array element at each position of the table, starting this setting from a first position of all the reference axes and successively performing it to a final position of all the reference axes, and selecting the symbol in the selecting sequence at each position so that it does not coincide with a symbol of an already determined array element at a line of former positions in each axial direction; and

a third step of, when the symbol is selected in the selecting sequence at each position of the table so that it does not become coincident with a first symbol and a second symbol of the symbols of the already determined array elements

57

at the line of the former positions in each axial direction, and when there is no symbol which can be selected and determined at an arbitrary position, continuing selection and determination by replacing the symbol of the already determined array element at a position one before the arbitrary position by a selectable symbol lower in the selecting sequence than the symbol.

12. A table creation program storage medium storing a program for searching for and creating a new m-dimensional and n-order table on the basis of an existing m-dimensional (m is a natural number of 4 or larger) and n-order (n is a natural number of 2 or larger) table, in which a symbol A = {a1, a2, $\cdots$, an} of n elements different from each other appears once in an axial direction of each of m reference axes, the table creation program storage medium being characterized by storing the program for causing a computer to execute:

a first step of setting the existing m-dimensional and n-order table, and determining and setting a permutation of the symbol of the n elements and a selecting sequence in accordance with the permutation;

a second step of arranging a symbol after successively returning along each axis in a direction toward a head position from an arbitrary position of each of the m axes of the existing table to a position where a symbol lower in the selecting sequence than a symbol of an array element of the existing table can

be selected; and

a third step of, after the symbol is arranged at the position where the symbol can be selected, selecting and determining a symbol as an array element in the selecting sequence at each position along each axis from the position where the symbol is arranged to a final position, so that it does not become a same symbol as an already determined array element at a former position of each axis.

13. A table creation program storage medium storing a program for searching for and creating a new m-dimensional and n-order table on the basis of an existing m-dimensional (m is a natural number of 4 or larger) and n-order (n is a natural number of 2 or lager) standard table, in which a symbol A = {a1, a2, ···, an} of n elements different from each other appears once in an axial direction of each of the m reference axes, the table creation program storage medium being characterized by storing the program for causing a computer to execute:

a first step of setting the existing standard table in which elements at a line of positions on each of m-dimensional and n-order axes form a line in a selecting sequence, and determining and setting a permutation of the symbol of the n elements and a selecting sequence in accordance with the permutation;

a second step of arranging a symbol after successively returning along each axis in a direction toward a head position

from an arbitrary position except for a head element position

on each axis, which can not be changed since it forms a standard

form of the existing table, to a position where a symbol lower

in the selecting sequence than a symbol of an array element

of the existing table can be selected; and

a third step of, after the symbol is arranged at the

position where the symbol can be selected, selecting and

determining a symbol as an array element in the selecting

sequence at each position along each axis from the position

where the symbol is arranged to a final position, so that it

does not become a same symbol as an already determined array

element at a former position of each axis.